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Amendments to Claims

1. (Currently Amended) A composition comprising a phenanthroline derivative having Formula I, shown in Figure 1,

$$(R^1)_X \xrightarrow{(R^2)_y} (R^1)_X \qquad (I)$$

wherein:

 ${\sf R}^1$ and ${\sf R}^2$ are the same or different at each occurrence and are selected from H, F, Cl, Br, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$;

a, b, c, and d are 0 or an integer such that a+b = 2n + 1, and c + d = 5. n is an integer 1-20;

x is 0 or an integer from 1 through 3;

y is 0, 1 or 2;

wherein at least one R1 is selected from substituted phenyl and substituted biphenyl having at least one substituent selected from F, CnHaFb, OCnHaFb. C6HcFd, and OC6HcFd;

with the proviso that there is at least one substituent on an aromatic group selected from F, C_pH_aF_b, OC_pH_aF_b, C₆H_cF_d, and OC₆H_cF_d when x is 1, both R¹ are not C₆H₄F.

- 2. (Original) The composition of Claim 1, wherein R¹ is selected from phenyl. substituted phenyl, biphenyl, substituted biphenyl, pyridyl, substituted pyridyl, bipyridyl, and substituted bipyridyl.
- 3. (Original) The composition of Claim 2, wherein R¹ is selected from substituted phenyl, substituted biphenyl, substituted pyridyl, substituted bipyridyl having at least one substituent selected from alkyl, heteroalkyl, aryl, heteroaryl, arylalkylene, heteroarylalkylene, CnHaFb, and C6HcFd.
 - 4. (Cancelled)

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5. (Currently Amended) The composition of Claim 1, wherein the A phenanthroline derivative is selected from Formulae I(b) through I(f) in Figure 3.

$$F_3$$
C \longrightarrow $N = \bigcirc$ II(c)

$$F_3C$$

$$\longrightarrow CF_3$$

$$= N$$

$$= N$$

$$= N$$

$$= N$$

$$= N$$

$$= N$$

$$F_3C$$
 CF_3
 F_3C
 CF_3
 F_3C
 CF_3

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6. (Withdrawn) A composition having a formula selected from Formula II(a) and Formula II(b) in Figure 2, wherein:

 R^1 and R^2 are the same or different at each occurrence and are selected from H, F, Cl, Br, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$

R³ is the same or different at each occurrence and is selected from a single bond and a group selected from alkylene, heteroalkylene, arylene, heteroarylene, arylenealkylene, and heteroarylenealkylene;

Q is selected from a single bond and a multivalent group;

m is an integer of at least 2;

n is an integer;

p is 0 or 1,; x is 0 or an integer from 1 through 3; and y is 0, 1, or 2.

- 7. (Withdrawn) The composition of Claim 6 wherein Q is selected from a hydrocarbon group with at least two points of attachment, selected from an aliphatic group, a heteroaliphatic group, an aromatic group, and a heteroaromatic group.
- 8. (Withdrawn) The composition of Claim 7 wherein Q is selected from alkylene groups, heteroalkylene groups, alkenylene groups, heteroalkenylene groups, alkynylene groups, and heteroalkynylene groups.
- 9. (Withdrawn) The composition of Claim 6 wherein Q is selected from single-ring aromatic groups, multiple-ring aromatic groups, fused-ring aromatic groups, single-ring heteroaromatic groups, multiple-ring aromatic groups, fused-ring aromatic groups, arylamines, silanes and siloxanes.
- 10. (Withdrawn) The composition of Claim 6, wherein Q is selected from Formulae III(a) through III(h) in Figure 4.
- 11. (Withdrawn) The composition of Claim 6, wherein R¹ is selected from phenyl, substituted phenyl, biphenyl, substituted biphenyl, pyridyl, substituted pyridyl, bipyridyl, and substituted bipyridyl.
- 12. (Withdrawn) The composition of Claim 11, wherein R^1 is selected from substituted phenyl, substituted biphenyl, substituted pyridyl, and substituted bipyridyl, having at least one substituent selected from alkyl, heteroalkyl, aryl, heteroaryl, arylalkylene, heteroarylalkylene, F, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$.
- 13. (Withdrawn) The composition of Claim 6, wherein at least one R^1 is selected from substituted phenyl and substituted biphenyl having at least one substituent selected from F, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$.

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14. (Withdrawn) The composition of Claim 6, wherein R³ is selected from a phenylene and a substituted phenylene.

- 15. (Withdrawn) The composition of Claim 14 having at least one substituent selected from alkyl, heteroalkyl, aryl, heteroaryl, arylalkylene, heteroarylalkylene, F, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$.
- 16. (Withdrawn) The composition of Claim 6, wherein R³ is selected from an alkylene group having from 1 through 20 carbon atoms.
- 17. (Withdrawn) The composition of Claim 6, wherein there is at least one substituent on an aromatic group selected from F, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$.
- 18. (Withdrawn) An electronic device comprising at least one layer that comprises a phenanthroline derivative having Formula I, shown in Figure 1, wherein:

 $\rm R^{1}$ and $\rm R^{2}$ are the same or different at each occurrence and are selected from H, F, Cl, Br, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, $\rm C_{n}H_{a}F_{b},$ $\rm OC_{n}H_{a}F_{b},$ $\rm C_{6}H_{c}F_{d},$ and $\rm OC_{6}H_{c}F_{d};$

a, b, c, and d are 0 or an integer such that a+b=2n+1, and c+d=5; n is an integer;

x is 0 or an integer from 1 through 3;

y is 0, 1 or 2;

with the proviso that there is at least one substituent on an aromatic group selected from F, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$.

- 19. (Withdrawn) The device of Claim 18, wherein R¹ is selected from phenyl, substituted phenyl, biphenyl, substituted biphenyl, pyridyl, substituted pyridyl, bipyridyl, and substituted bipyridyl.
- 20. (Withdrawn) The device of Claim 19, wherein R¹ is selected from substituted phenyl, substituted biphenyl, substituted pyridyl, substituted bipyridyl having at least one substituent selected from alkyl, heteroalkyl, aryl, heteroaryl, arylalkylene, heteroarylalkylene, C_nH_aF_b, and C₆H_cF_d.
- 21. (Withdrawn) The device of Claim 18, wherein at least one R^1 is selected from substituted phenyl and substituted biphenyl having at least one substituent selected from F, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$.
- 22. (Withdrawn) The electronic device of Claim 18, wherein the phenanthroline derivative is selected from Formulae I(a) through I(i) in Figure 3.

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23. (Withdrawn) An electronic device comprising at least one layer that comprises a composition having a formula selected from Formula II(a) and Formula II(b) in Figure 2, wherein:

 R^1 and R^2 are the same or different at each occurrence and are selected from H, F, Cl, Br, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, heteroaryl, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$,

R³ is the same or different at each occurrence and is selected from a single bond and a group selected from alkylene, heteroalkylene, arylene, heteroarylene, arylenealkylene, and heteroarylenealkylene;

Q is selected from a single bond and a multivalent group;

m is an integer equal to at least 2;

n is an integer;

p is 0 or 1;

x is 0 or an integer from 1 through 3; and

y is 0, 1, or 2.

- 24. (Withdrawn) The device of Claim 23 wherein Q is selected from a hydrocarbon group with at least two points of attachment, selected from an aliphatic group, a heteroaliphatic group, an aromatic group, and a heteroaromatic group.
- 25. (Withdrawn) The device of Claim 24 wherein Q is selected from alkylene groups, heteroalkylene groups, alkenylene groups, heteroalkenylene groups, and heteroalkynylene groups.
- 26. (Withdrawn) The device of Claim 23 wherein Q is selected from single-ring aromatic groups, multiple-ring aromatic groups, fused-ring aromatic groups, single-ring heteroaromatic groups, multiple-ring aromatic groups, fused-ring aromatic groups, arylamines, silanes and siloxanes.
- 27. (Withdrawn) The device of Claim 23, wherein Q is selected from Formulae III(a) through III(h) in Figure 4.
- 28. (Withdrawn) The device of Claim 23, wherein R¹ is selected from phenyl, substituted phenyl, biphenyl, substituted biphenyl, pyridyl, substituted pyridyl, bipyridyl, and substituted bipyridyl.
- 29. (Withdrawn) The device of Claim 28, wherein R¹ is selected from substituted phenyl, substituted biphenyl, substituted pyridyl, and substituted bipyridyl,

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having at least one substituent selected from alkyl, heteroalkyl, aryl, heteroaryl, arylalkylene, heteroarylalkylene, F, C_nH_aF_b, OC_nH_aF_b, C₆H_cF_d, and OC₆H_cF_d.

- 30. (Withdrawn) The device of Claim 23, wherein at least one R^1 is selected from substituted phenyl and substituted biphenyl having at least one substituent selected from F, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$.
- 31. (Withdrawn) The device of Claim 23, wherein R³ is selected from a phenylene and a substituted phenylene.
- 32. (Withdrawn) The device of Claim 31 having at least one substituent selected from alkyl, heteroalkyl, aryl, heteroaryl, arylalkylene, heteroarylalkylene, F, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$.
- 33. (Withdrawn) The device of Claim 23, wherein R³ is selected from an alkylene group having from 1 through 20 carbon atoms.
- 34. (Withdrawn) The device of Claim 23, wherein there is at least one substituent on an aromatic group selected from F, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$.
- 35. (Withdrawn) A composition comprising a phenanthroline derivative having Formula II, shown in Figure 2, wherein:
 - R^2 and R^3 are the same or different at each occurrence and are selected from H, alkyl, heteroalkyl, aryl, heteroaryl, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$;
 - a, b, c, and d are integers such that a+b=2n+1, and c+d=5, x is 0 or an integer from 1 through 3;

y is 0, 1 or 2;

with the proviso that there is at least one substituent on an aromatic group selected from F, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$.

36. (Withdrawn) A composition selected from Formula II(a) in Figure 2, wherein:

Q is selected from a single bond and a multivalent group;

m is an integer from 2 through 10;

R³ is the same or different at each occurrence and is selected from a single bond and a group selected from alkylene, heteroalkylene, arylene, heteroarylene, arylenealkylene, and heteroarylenealkylene;

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 R^1 and R^2 are the same or different at each occurrence and are selected from H, alkyl, heteroalkyl, aryl, heteroaryl, $C_nH_aF_b$, $OC_nH_aF_b$, $C_6H_cF_d$, and $OC_6H_cF_d$

y is 0, 1 or 2.

- a, b, c, and d are integers such that a+b=2n+1, and c+d=5,
- 37. (Withdrawn) The composition of Claim 36 wherein Q is selected from Formulae III(a) through III(h) in Figure 4.
- 38. (Withdrawn) An electronic device comprising at least one layer comprising the composition of any one of Claims 35 through 37.
- 39. (Withdrawn) An electronic device of Claims 35 through 37, wherein the device is a light-emitting diode, light-emitting electrochemical cell, or a photodetector.